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Revision of the United States species of the genus Fuirena.

By Frederick V. Coville.

Plate XCVIII.

The various forms of *Fuirena* grouped under the name *F. squarrosa*, Mx., show much variation in both external and internal characters. The external variations are confined commonly to those of size, hairiness, and inflorescence. The height varies from 5 cm. to 90 cm.

Hairiness of the leaves, stem, and sheaths seemed at first to form the basis of good varietal distinctions, but a careful comparison of specimens shows that there is sometimes wide variation within the limits of a variety. I am inclined to believe that these differences may be due largely to individual environment. They certainly are not in all cases co-ordinate with other well defined characters.

The width of the leaves varies, in the specimens that I have examined, from 1 mm. to 7 mm. according to the size of the plant. The inflorescence varies from a single spike to one or a few several-spiked heads. The internal variations noted are in the length of the stipe of the achenium, the length and roughness of the bristles, and several variations in the perianth-scales.

The achenium may have a stipe equal to its own length, or may be nearly sessile. The bristles are sometimes shorter than the stipe of the achenium, when they are usually smooth; or they may equal the achenium, or even greatly exceed it. In these latter cases they are retrorsely barbed.

The perianth scales have a stalk reaching to about the base or middle of the achenium, and there expanding into a blade (usually referred to as the scale). The scale varies in form from narrowly oblong with acute apex and base, to broadly oblong with obtuse apex and base, and deltoid ovate with acute apex and cordate or truncate base. It varies also much in thickness,

that part which lies above the middle of the achenium being spongy, thickened and plump; in mature specimens the lower portion, by compression against the achenium, being thin and showing three, or sometimes only one, nerve. In immature specimens the scales are not thick and plump above but of nearly the same leathery texture throughout, the nerves traceable to the apex. The middle nerve may end in a mere apiculation, in some cases wanting, or may be produced into a short blunt point or long barbed awn. And in some cases this awn may arise on the back of the scale slightly below the apex.

While making an examination of the forms that have been grouped under *F. squarrosa* it seemed desirable to include as well our other entirely distinct species, *F. scirpoidea*; and as a result the following revision of the species of *Fuirena* of the United States is presented.

The localities given after each species and variety were taken (except in one case which is indicated) from actual specimens examined by the writer. These were in the herbaria of Columbia College, Harvard University, Cornell University, Academy of Natural Sciences of Philadelphia, William M. Canby, Isaac C. Martindale, John Donnell Smith, and the National Herbarium; and thanks are due to these three gentlemen, to Dr. Sereno Watson, Dr. N. L. Britton, Prof. William R. Dudley and John H. Redfield, for their kindness in facilitating the work.

To Dr. Britton I am especially indebted for notes from Mr. C. B. Clarke of Kew, and for many valuable suggestions. The specimens in the Shaw herbarium were examined, but by an oversight the localities are not included.

FUIRENA.

Rottboell, Descr. et Icon. Pl. p. 70 (1773).

Inflorescence in terminal and axillary heads of spikelets, the axillary ones sometimes wanting, and the terminal one reduced even to a single spikelet. Spikelets many-flowered. Glumes imbricated on all sides, aristate or mucronate, the lowest one or two empty. Flowers hermaphrodite. Perianth-scales three, not conduplicate, commonly stipitate, membranaceous or thickened, in the American species with as many bristles alternating. Stamens three. Style single, slender, not thickened at the base nor

articulated with the ovary, deciduous. Stigmas three, slender. Achenium about as broad as long, sharply and equally triquetrous, mucronate.

KEY TO THE SPECIES AND VARIETIES.

a. Leaves reduced to bladeless sheaths. *F. scirpoidea.*

aa. Leaves with well-developed blades. (*b*).

b. Awn arising abruptly from the back of the perianth-scale, just below its apex. *F. simplex.*

bb. Awn when present borne on the apex of the perianth-scale, which tapers into it. (*c*).

c. Bristles reaching at least to the middle of the achenium, retrorsely barbed. (*d*).

d. Perianth-scales narrowly to broadly oblong with a slender awn tapering to a minute point. *F. squarrosa.*

dd. Perianth-scales rhomboidal or deltoid-ovate with a thick short awn or point. *F. squarrosa var. hispida.*

cc. Bristles not exceeding the stipe of the achenium, smooth. Perianth-scales awnless or with a mere apiculation. *F. squarrosa var. breviseta.*

FUIRENA SCIRPOIDEA.

Rhizome conspicuous, stout, the stems arising from it singly at frequent intervals. Stems slender, about 20-40 cm. in height, unbranched, terminated by 1-3 spikelets. Sheaths 2 cm. long or less, loose, acute, bladeless. Glumes mucronate, the points appressed. Achenium sessile or nearly so by a narrow base. Bristles sometimes reaching the apex of the achenium and retrorsely barbed, sometimes nearly obsolete. Scales orbicular-oblong, obtuse at the apex or nearly apiculate, minutely scabrous along the upper margin.

Michaux, Fl. Bor.-Amer. i. p. 37, t. 7 (1803); and other authors. *Vaginaria Richardi*, Pers. Syn. Pl. i. p. 70 (1805); and other authors.

This plant is very distinct from the other species and shows little variation. The structure of the fruit is very similar to that of *F. squarrosa var. breviseta*, the bristles being usually longer and barbed, and the stipe of the achenium and the stalks of the scales shorter.

Georgia (Leconte). Florida (Rugel, Keeler); Miami (Garber); Duval County (Curtiss); Lake Monroe (Garber); St. Augustine (Canby); Apalachicola (Chapman, Saurman); Jacksonville (Curtiss No. 3067). Alabama; Mobile (Mohr). Louisiana; below New Orleans on the Mississippi (Langlois); New Orleans (Ingalls).

FUIRENA SIMPLEX.

Rhizomes usually wanting, and stems tufted. Leaves with well developed, flat, grass-like blades. Glumes with a long squarrose or recurved awn. Achenium nearly sessile. Bristles reaching about to the apex of the achenium, retrorsely barbed. Scale-stalks reaching to the base or middle of the achenium. Scales ovate-oblong, obtuse at the base, with a tendency to become cordate, unusually notched at the obtuse apex. Awn slender, commonly smooth, occasionally retrorsely barbed, sometimes fully as long as the body of the scale, sometimes short and minute, arising abruptly from the back of the scale just below the apex.

Vahl, Enum. Pl. ii. p. 384 (1806). *F. squarrosa*, Torrey Ann. Lyc. Nat. Hist. N. Y. ii. p. 252† (1828).* *F. squarrosa* var. *aristulata*, Torrey, l. c. iii. p. 291 (1836).* *F. Schiedeana*, Kunth, Enum. Pl. ii. p. 183 (1837), fide Boeckeler, Linnaea, xxxvii. p. 105.

Plant 8-50 cm. in height, prevailingly smooth, and frequently with short thickish leaves. It differs conspicuously from all the other forms in that the awn rises abruptly, not by a gradual tapering, from the scale. The scales become plump much earlier than in *F. squarrosa*, so that it is seldom possible to find one that shows the nerves, and when mature they are uniformly of a pale buff color, while in *F. squarrosa* they are commonly chestnut-brown.

Arkansas (?) (Long's first expedition, James). Indian Territory (?); Canadian River (Bigelow). Texas (Wright No. 718, 1849; Lindheimer No. 557, 1846); Sutherland Springs (Palmer No. 1335, 1879); Eastern Texas (Hall No. 693, in part, 1872); Fredericksburg (Thurber No. 72, 1850); Dallas (Reverchon No. 562, 1876; Hempstead (collector unknown). New Mexico (Fendler No. 877, 1847). Mexican boundary Survey No. 1523. Herb. Berlandier Texano-Mexicanum No. 3224. Mexico (F. Mueller No. 2147, 1853); Monclova (Palmer No. 1336, 1880).

Forma MACROSTACHYA (Britt.)

F. squarrosa var. macrostachya, Britt., Bull. Torr. Bot. Club, xi. p. 87 (1884).* This appears to me to differ from the typical form

* Type specimens examined. † Paper of 1828 read in 1826.

of *F. simplex* scarcely enough to be called a variety, and Dr. Britton agrees with me in this opinion. It is unusually large throughout, with long (about 2 cm.) spikelets. "Valley of the lower Rio Grande" (Buckley).

FUIRENA SQUARROSA.

Rhizomes,* leaves and glumes as described under *F. simplex*.

Achenium nearly sessile. Bristles slender, tapering to the apex, usually exceeding the achenium, retrorsely barbed. Scale-stalk reaching the middle of the achenium. Scale narrowly to broadly oblong, acuminate at both ends, or sometimes abrupt at the base, frequently only one-nerved, tapering into a slender tapering awn usually exceeding the scale and smooth or backwardly barbed.

Michaux, Fl. Bor.-Amer. i. p. 37 (1803). *F. squarrosa*, var. *pumila*, Torrey, Compend. Fl. North. & Mid. States, p. 46 (1826); Ann. Lyc. Nat. Hist. N. Y. iii. p. 291 (1836) †; Fl. N. Y. ii. p. 345 (1843); Gray Man. Bot. (5th Ed.) p. 556, Pl. II. (1867).

Plant usually small, 5-15 cm. in height, but sometimes reaching 60 cm., mostly smooth except the lower sheaths. Inflorescence sometimes reduced to a single spikelet. The bristles are sometimes twice as long as the stipe and achenium together, and the awn in such cases may equal the scale and its stalk. The barbing of the awn is more conspicuous in these two cases, and wanting in the other extreme. I have seen one depauperate specimen in which both bristles and awns were almost entirely wanting, but the plant undoubtedly belonged here.

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* After this paper was completed the writer, while in the field one day, saw for the first time (never having lived in a region in which *Fuirena* grew) a living specimen of *F. squarrosa*, var. *hispida*. While collecting some of the plants he was astonished to find that the rootstocks were plentifully supplied with ovoid tubers about 5 mm. in diameter. It has been learned since that Mr. Theodore Holm of Washington had observed the same organs, and has found the character a constant one. He is preparing a paper on the subject. Not one of the large number of herbarium specimens examined during the work of revision bore a tuber, and I cannot now say whether they are found in any of the other forms. The specimens of the typical form, however, look as if they had never borne tubers.

† The following are given by Torrey in this article as synonyms. I have been unable to examine the descriptions myself. *F. squarrosa var. pumila*, Torrey, Fl. North. & Mid. States i. p. 68 (1824); *F. pumila*, Sprengel, Syst. Veg. i. p. 237 (1825); Schultes, Syst. Veg. Mant. iii. p. 546 (1827). *F. Torreyana*, Beck, Bot. North. and Mid. States p. 429 (1833).

By the kindness of Mr. C. B. Clarke of the Royal Herbarium at Kew, I have been able to ascertain that this is the typical form of Michaux's *F. squarrosa*. He writes "Our original specimen of Michaux named *squarrosa* is the slender plant 6 to 8 inches high with fibrous roots, in short=*simplex* Vahl. var. *pumila* sp. Spreng."

Although in the extreme forms of this and var. *hispida* the internal characters are so widely different, a series of connecting forms exists, co-ordinate to some extent with the size of the plant. The original specimen of Michaux as well as Torrey's type of var. *pumila* were small plants, but a series has been made (whose internal characters are identical and whose only external difference is one of size), of which the largest specimen is, as stated above, 60 cm. in height.

Massachusetts; Plymouth (Oakes, Tuckerman); Tewksbury (Torrey, Boott). Rhode Island; Providence (Olney). Long Island, Babylon (Torrey). New Jersey; Monmouth County (Eaton); Cape May (Parker). Delaware; Townsend (Canby). Maryland; Salisbury (Canby). North Carolina; Wilmington (Canby). Florida; Micanopy (Leavenworth); Duval Co. (Curtiss No. 3068, in part). Louisiana (Hale). Michigan, Cass Co. (Wright, specimen in herbarium of Isaac Martindale); "Macomb County, Dr. B. Cooley" (Wheeler & Smith Cat. Pl. Mich. p. 86).

FUIRENA SQUARROSA, MICHX., VAR. BREVISETA.

Stipe and achenium usually of equal length. Bristles not exceeding the stipe, smooth. Scale-stalks reaching above the middle of the achenium. Scales broadly oblong or orbicular, rounded at the apex, with an abrupt apiculation, minutely scabrous along the upper margin.

F. squarrosa, Chapman, Fl. South. States, p. 514 (1865). *F. squarrosa*, var. *α*, Torrey Ann. Lyc. Nat. Hist. N. Y. iii. p 290 (1836).*

The plants are usually 10-20 cm. in height, and may be almost smooth throughout, or the sheaths, especially the lower ones, may be densely hirsute, and the leaves and culm sparingly so. The tips of the bristles are usually incurved into the space below the nut. The stipe of the achenium and the stalks of the scales are longer than in any other North American form of the

* Type specimens examined.

genus. The scales in this form do not become so plump as in the typical form, the var. *hispida* and *F. simplex*, and in mature specimens it is frequently necessary to use a compound microscope to see the scabrosity of their upper margins.

I have never had any difficulty in deciding whether a specimen went into var. *hispida* or var. *breviseta*, the distinctive characters, although slight, being clearly defined and constant. Nevertheless these differences seem too inconsequential for the basis of a separate species, and although intermediate forms have not been seen, they may be expected.

North Carolina (McCarthy); Wilmington (Curtiss). South Carolina (Gibbs); Santee Canal (Ravenel). Georgia; Macon (collector not given); Sunbury (Le Conte). Florida (Chapman, Buckley); Duval County (Curtiss No. 3068, in part); Miami (Garber); Apalachicola (Saurman). Alabama (Gates, Mohr). Louisiana (Langlois); New Orleans (Ingalls, Drummond). Eastern Texas, (Neally).

FUIRENA SQUARROSA, var. HISPIDA (Ell.), Chapm.

Stipe a little shorter than the achenium. Bristles reaching about the middle or apex of the achenium, retrorsely barbed down the inner face. Scale-stalks reaching the middle of the achenium. Scales rhomboidal, or deltoid-ovate with cordate or truncate base, tapering into a short thick unbarbed awn or point, usually minutely scabrous along the upper margin and about the base of the awn.

Chapman, Fl. South. States, p. 514 (1865); *F. hispida*, Elliott, Sketch Bot. S. C. & Geor. i. p. 579 (1824).* *F. squarrosa*, Torrey, Compend. Fl. Nor. & Mid. States, p. 45, (1826)†; Gray, Man. Bot. p. 556 (1867). *F. squarrosa, var. β.* Torrey, Ann. Lyc. Nat. Hist. N. Y. iii. p. 291 (1836).* *F. squarrosa*, var. γ, Torrey l. c.* *F. squarrosa*, var. 1, Torrey, Fl. N. Y. ii. p. 345 (1843).

Plant 40-90 cm. in height, usually slender, with long internodes, the sheaths almost always, and the stem and leaves frequently, densely hirsute. A great range of variation in the ap-

* Type specimens examined.

† *F. squarrosa* Torr. Fl. N. & Mid. States i, p. 67 is also probably a synonym. I have been unable to see the work.

pearance of the scales occurs, they when immature being coriaceous and showing the three nerves; but when mature being very plump, apparently nerveless, and sometimes with merely an acute apex in place of the awn. Occasionally some of the fruits in a spike have been found with bristles unbarbed. In fully mature specimens this is especially apt to be true, and at the same time the scabrosity of the apex of the scale becomes lost. Torrey's type of var. γ are immature specimens of a form of this variety with scales narrower than usual, and awns longer, the plant varying toward *var. pumila*.

In his description of the species *F. squarrosa* and *F. hispida*, Elliott said very little of the characters of the perianth scales, but characterized the last species principally by its slender habit and hirsute sheaths. *F. squarrosa* was described first and a drawing made.* This drawing is curiously enough an excellent one of the *var. hispida*, afterward described in the appendix as a species, with no reference to the figure. It seems clear, therefore, that Elliott, at that time at least, did not understand the true distinctions of the two forms, basing them on characters usually present but not crucial.

New York; Junius, Seneca County (Sartwell). New Jersey (Eaton, Torrey); Cape May (Martindale). Maryland, Salisbury (Canby, Moyer). Virginia; Prince Edward County (J. D. Smith). District of Columbia (Ward). South Carolina; Aiken (Ravenel). Georgia (Chapman). Kentucky (Short). Florida (Buckley, Chapman). Alabama (Bigelow); Montgomery (McCarthy). Louisiana (Hale). Texas (Lindheimer No. 204, 1843, Nealley); Hempstead (Hall No. 693, in part, 1872).

EXPLANATION OF THE PLATE.

Figures of the fruit, (achenium, bristles, and perianth-scales) of *Fuirena*. All enlarged about ten diameters.

1.—*F. scirpoidea*, Michx.
2.—*F. simplex*, Vahl.
3.—*F. squarrosa*, Michx.
4.—*F. squarrosa*, Michx. var. *hispida* (Ell.), Chapm.
5.—A scale of the same, as it appears when young.
6.—*F. squarrosa*, Michx. var. *breviseta*, Coville.

* Ell. Sk. i. pl. I. fig. 3.

An Enumeration of the Plants Collected by Dr. H. H. Rusby in South America, 1885-1886.—X.

(Continued from Vol. XVI, p. 327.)

Inga strigillosa, Spruce in Mart. Fl. Bras. Reis, 1,500 ft. (1002).

Inga nobilis, Willd. Enum. 1047. Mapiri, 2,500 ft. (1003).

Inga edulis, Mart. Herb. fl. Bras. 113. Unduavi, 8,000 ft. (991); Junction of the Beni and Madre de Dios (995).

Inga marginata, Willd. Sp. Pl. iv. 1015. Guanai, 2,000 ft. (994; 998; 999).

Inga punctata, Willd. l. c. 1016. Beni River, (1000).

Inga Matthewsiana, Benth. in Hook. Lond. Journ. Bot. iv. 594. Guanai, 2,000 ft. (996).

Inga tomentosa, Benth. Trans. Linn. Soc. xxx. 609. Mapiri, 5,000 ft. (997).

Inga stipularis, DC. Mem. Leg. 440. Mapiri, 5,000 ft. (1004).

INGA BOLIVIANA, spec. nova. Flores tomentelli, in receptaculo distincte pedicellati, umbellam globosam formantes; pedicelli calyce longiores; petiolus nudus; foliola 3-4 juga, elliptico-oblonga, apice acuminata, utrinque glabra, venulosa, sessiles, 9-20 cm. longa; umbellæ longiuscule pedunculatæ, pedunculi tomentelli; pedicelli 5-8 mm., calyc. 4-6 mm., corolla 10 mm. longa; legumen ignotum. Junction of the Rivers Beni and Madre de Dios (990). This is nearest to *I. quaternata*, Pœpp. & Endl. but has much larger leaflets and less woolly flowers.

Inga, probably undescribed; collected only in fruit. Junction of the Beni and Madre de Dios (993 and 2375). Some flowers of *I. edulis*, Mart. were accidentally distributed with No. 993.

Inga, related to *I. nobilis*, but with thin membranaceous leaves and simple inflorescence. Mapiri, 2,500 ft. (1001). This is most likely an undescribed species.

ROSACEÆ.

Licania Benthami, Hook. f. in Mart. Fl. Bras. xiv. (2) 12. Junction of the Madre de Dios and Beni (2420). The same as Spruce No. 3278.

LICANIA PALLIDA, spec. nova. Folia oblonga, utrinque pallida et glabra, 10-12 cm. longa, 5 cm. lata; petiola crassa, 1 cm. longa; paniculæ terminales et axillares; ramulis, bracteolis, pedunculis calicibusque albo-pubescentibus; flores spicati;

spicæ 3-4 cm. longæ, 8mm. latæ; pedunculi 2 mm. longi; bracteolæ longiores; stamina sub 5, exserta, petala longiores; fructus ignotus. Junction of the Beni and Madre de Dios (2442). Apparently nearest to *L. polita*.

Hirtella Americana, Aubl. Guian. i. 247. Guanai, 2,000 ft. (702); Mapiri, 5,000 ft. (704). Junction of the Beni and Madre de Dios (1371). A widely diffused and variable species.

Hirtella bullata, Benth. in Hook. Journ. Bot. ii. 216. Reis, 1,500 ft. (703). The same as Spruce No. 3084, Herb. Kew.

HIRTELLA BURCHELLII, spec. nova. Flores in paniculas angustas dispositi; paniculæ rufo-villosæ, angustæ, axillares terminalibusque, 12-20 cm. longæ; ramulis rufo-villosis; foliis ovato-oblongis, acuminatis, basi rotundatis, utrinque nitidis, supra lævis, subtus ad nervos parce villosis; pedunculis 2mm. longis calicibusque dense villosis. Beni River (1222). The same as Burchell's Nos. 6331, 6416 and 6571, Herb. Kew. Nearest to the preceding species.

Hirtella triandra, Sw. Prodr. 57. Reis, 1,500 ft. (1448).

Hirtella bracteata, Mart. & Zucc. Abhand. Akad. Munch. x. 384? Guanai, 2,000 ft. (2492). Specimens insufficient for certain determination.

Couepia glaucescens, Spruce in Mart. Flor. Bras. xiv. (2) 49. Falls of Madeira, Brazil (2678).

Prunus salicifolia, HBK. Nov. Gen. iv. 241. Near La Paz, 10,000 ft. (480).

Quillaja Saponaria, Mol. Chil. 354. Sorata, 8,000 ft. (728).

Rubus megallococcus, Focke, Abhand. Nat. Gesell. Bremen, iv. 157. Unduavi, 8,000 ft. (470 and 472). The same as Mandon's 662.

Rubus Boliviensis, Focke, l. c. 158. Same locality (468). Distributed as *R. Sellowii*, C. & S.? The same as Mandon's 656.

Rubus Bogotensis, HBK. l. c. vi. 220. Unduavi, 8,000 ft. (474). Possibly this may be an extreme form of *R. floribundus*.

Rubus roseus, Poir. Dict. vi. 237. Unduavi, 8,000 ft. (473 and 469). The same as Mandon's Nos. 659 in part and 661.

Rubus glaucus, Benth. Pl. Hartw. 173. Yungas, 6,000 ft. (471).

RUBUS RUSBYI, spec. nova. Ascendens; tomentosus; folia integra, petiolata, serrata, utrinque tomentosa; stipulis latis,

ovatis; ramulis, petiolisque minute recurvo-aculeatis; floris solitariis, 2 cm. latis; sepalis ovatis, acutis, 8 cm. longis, dense tomentosus. Planta 50 cm. alta; folia 4 cm. longa, 2 cm. lata. Next to *R. Loxensis*, Benth. Unduavi, 10,000 ft. (2508).

Fragaria Chilensis, Ehrh. Beitr. vii. 26. Near La Paz, 10,000 ft. (479).

Alchemilla aphanoides, Mutis. in Linn. f. Suppl. 122. Unduavi, 8,000 ft. (851).

Alchemilla hirsuta, HBK. l. c. 226. Sorata, 13,000 ft. (477).

Alchemilla tripartita, R. & P. Fl. Per. i. 68. Unduavi, 10,000 ft. (476); 8,000 ft. (849 and 850, the latter a large, strong form).

Alchemilla pectinata, HBK. l. c. 226. Unduavi, 10,000 ft, (475).

Alchemilla pinnata, R. & P. l. c. 69. Near La Paz, 10,000 ft. (2551).

Alchemilla, probably a reduced form of *A. hirsuta*. Sorata, 13,000 ft. (1855). The same in Herb. Kew, coll. by Jameson in Columbia.

Acæna ovalifolia, R. & P. l. c. 67. Unduavi, 8, 000 ft. (467).

Acæna cylindrostachya, R. & P. l. c. 68. Near La Paz, 10,000 ft. (466).

Poterium Sanguisorba, L. Sp. Pl. 1411. Near La Paz, 10,000 ft. (1926). Introduced from Europe.

OSTEOMELES PERNETTYOIDES (Wedd.) (*Hesperomeles pernettyoides*, Wedd. Chlor. And. ii. 231). Sorata, 8,000 ft. (1787). Unduavi, 10,000 ft. (2039).

SAXIFRAGEÆ.

Escallonia rubra, Pers. Ench. i. 235. Valparaiso, Chili (1024).

Escallonia revoluta, (R. & P). Pers. l. c. Same locality (487 and 1772).

PHYLLONOMA INTEGERRIMA (Turcz). (*Dulongia integerrima*, Turcz. Bull. Soc. Moscou, 1858, 454). Mapiri, 5,000 ft. (2521). A form with serrate leaves. I am obliged to Mr. N. E. Brown for putting me on the track of this plant.

Weinmannia hirtella, HBK. l. c. 56. Mapiri, 10,000 ft. (2040).

Weinmannia elliptica, HBK. l. c. 50. Yungas, 6,000 ft. (535); Unduavi, 8,000 ft. (536). Some of these specimens were distributed as *W. subsessilifolia*, R. & P.?

Ribes albiflorum, R. &. P. Fl. Per. iii. 12. Unduavi, 8,000 ft. (478).

HALORACEÆ.

Gunnera scabra, R. & P. l. c. t. 44. Unduavi, 8,000 ft. (624).

COMBRETACEÆ.

Combretum Jacquini, Griseb. Fl. Brit. West Indies, 275. Junction of the Beni and Madre de Dios (721).

Combretum Læflingii, Eichl. in Mart. Fl. Bras. xiv. (2) 110. Guanai, 2,000 ft. (622), and (2635?) the latter in fruit only.

Combretum Aubletii, DC. Prodr. iii. 19. Beni River (1773).

Combretum, sp. undetermined. Guanai, 2,000 ft. (623).

MYRTACEÆ.

Eucalyptus capitellatus, Sm. Bot. Nov. Holl. 42. Near Valparaiso (600). Cultivated.

Calyptranthes, a species near *C. Spruceana*, Berg. Guanai, 2,000 ft. (1226). Not at Kew, and perhaps undescribed. Collected only in fruit.

Psidium pomiferum, L. Sp. Pl. 672. Beni River (2083).

Psidium polycarpon, Lamb. Trans. Linn. Soc. xi. 231. Yungas, 4,000 ft. (2460).

Psidium, sp. Falls of Madeira, Brazil, (2084).

Psidium aromaticum, Aubl. Guian. i. 485. Falls of Madeira (2085). Compared with Schomburgh's No. 355, Herb. Kew, and appears not distinct.

Myrtus microphylla, Humb. & Bonpl. Pl. Æquin. t. 4. Sorata, 10,000 ft. (2042).

Myrcia lanceolata, Camb. in St. Hil. Fl. Bras. Merid. ii. 236. Yungas, 6,000 ft. (605 and 1447).

Myrcia Selloana, Berg in Mart. Flor. Bras. xiv. (1) 197. Falls of the Madeira (585); Junction of the Beni and Madre de Dios, (592) and 586).

Myrcia velutina, Berg, l. c. 182. Falls of the Madeira (590).

Myrcia Paivæ, Berg, l. c. 179. Yungas, 4,000 ft. (598). The same as Spruce No. 486.

Myrcia anacardiæfolia, Berg, Gardn. Lond. Journ. Bot. ii. 354. Falls of the Madeira (2683).

Myrcia Berberis, DC. Prodr. iii. 254? Falls of the Madeira (587).

Bibliographical Notes on well known Plants.—X.

By Edward L. Greene.

Rhus Canadensis, Marshall, Arb. 129 (1785).
Rhus aromatica, Ait. Hort. Kew. i. 367, and
Rhus suaveolens, Ait. l. c. 368 (1789).
Betula triphylla, Thunb. Diss. Betul. 12 (1807).

Although Marshall's descriptions are never clearly diagnostic, still, in the case of this *Rhus* it would seem as if no American botanist could doubt for a moment what bush the man had in view. But the name has always been placed in the synonymy of *R. aromatica* sometimes with,—as often without—a mark of doubt. At the time of his writing there was no other known North American shrub to which his description would apply; and there is no excuse for our continuing to employ the later name *R. aromatica*. Thunberg's grave error in referring the bush to the genus *Betula*, is not more remarkable than that of his master Linnæus, when the latter, as some critics assure us, first published his *Rhus typhina* as a species of *Datisca* (*D. hirta*, Linn. Sp. Pl. 1037).

That Aiton's *R. aromatica* and *R. suaveolens* are one and the same species has long been admitted on all sides; the two names are about equally good, and the uniform retention of the first rather than the second is one of many cases in which authors have, with one consent, recognized the principle of priority of place.

There was an earlier *Rhus Canadensis* of Philip Miller, and this, in days long past, may have stood with some people in the way of the adoption of that of Marshall. But Miller's name is conceded to be a synonym either of *R glabra* or *R. typhina*. It was a pinnate-leaved species, at all events, and a mere synonym, and cannot therefore stand in the way of the restoration of *R. Canadensis*, Marsh.*

*In the deep cañons of Northern Arizona which lead down to the Grand Cañon of the Colorado, I discovered a few months since an exceedingly interesting shrub which will bear the following name and description:

Rhus Canadensis, Marsh., var. SIMPLICIFOLIA. Shrub 3 or 4 feet high, diffuse, slender; leaves an inch long or less, round-ovate, obtuse, nearly truncate at base, coarsely and somewhat evenly crenate, rarely with a very small lobe or separate leaflet on one side below; spikes few flowered, almost capitate.

RUBUS PARVIFLORUS, Nutt. Gen. i. 309 (1818).

Rubus Nutkanus, Moç. Seringe in DC. Prodr. ii. 566 (1825).

Publication cannot date from drawings, any more than from manuscripts, so long as they remain mere engraver's or printer's "copy;" and the named drawings of Nutkan plants by Moçino passed into publicity by means of the several volumes of the Prodromus; hence Nuttall's name for this widely dispersed western *Rubus* must be preferred in place of that now long in vogue, for it has priority of publication by seven years. When the species first became known there were doubts expressed in various quarters as to its distinctness from the eastern *R. odoratus;* but such doubts no longer obtain, although rose-tinted petals lately observed in some individuals of our western and usually white-flowered shrub, and the fragrance of the flowers, not at first noted, together reassert the close affinity.

Along the Californian coast this *Rubus* takes on a firmer texture of foliage, and therewith an almost velvety vestiture of pubescence,—differences quite sufficient to place it in the rank of a named variety. At first it was even regarded as a valid species (*R. velutinus*, H. & A.) and its name should be *Rubus parviflorus*, Nutt., var. VELUTINUS (H. & A.)

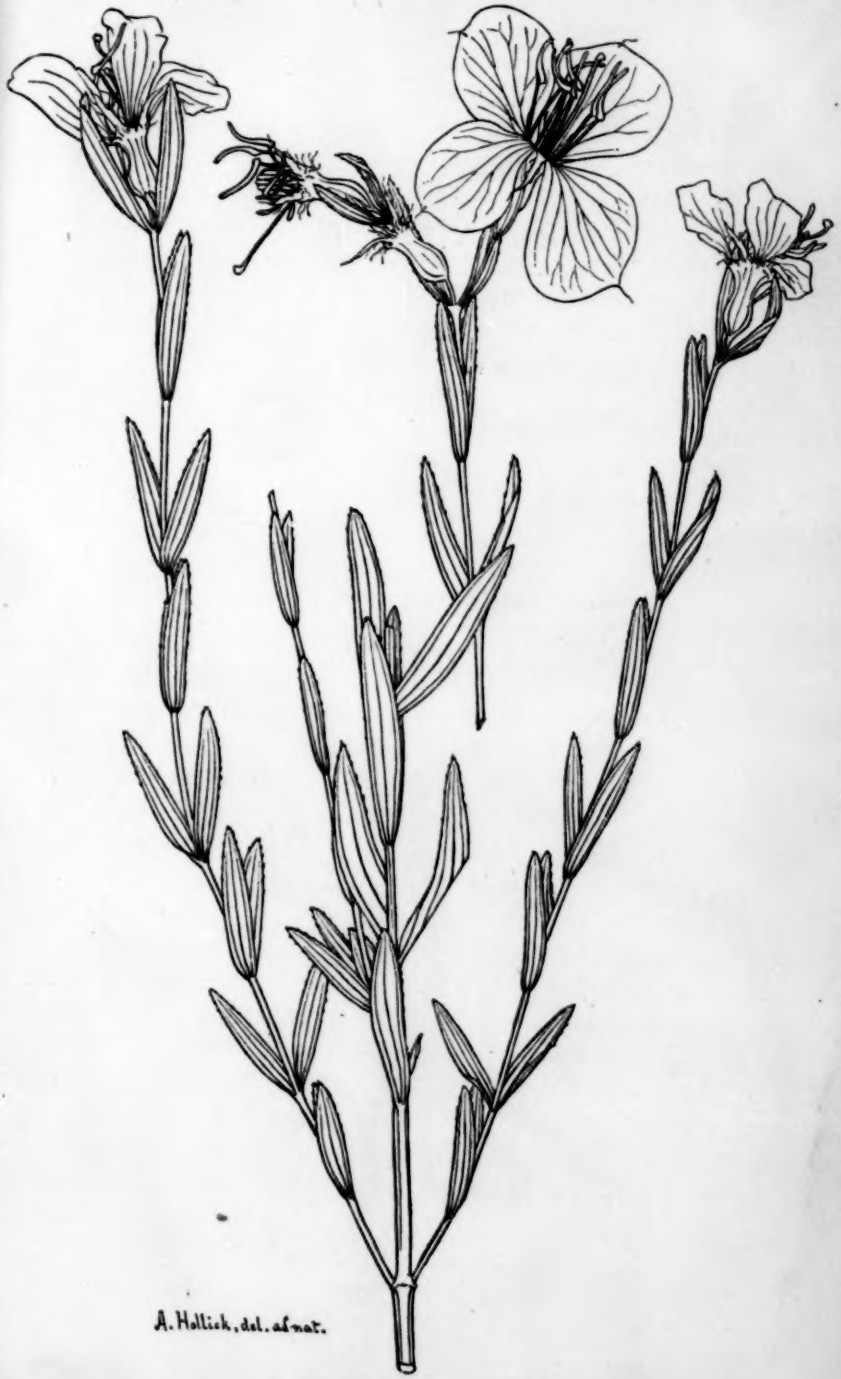
GLEDITSCHIA INERMIS, Crantz, Inst. Rei Herb. i. 219 (1766).

The bibliography of this tree, as given at page 110 of volume xv. of this Journal, must be amended in accordance with the fact that Crantz (not Miller), is the real author of this name.

A New Species of Rhexia.

(Plate XCIX.)

RHEXIA ARISTOSA. Stem square, slender, about 7 dm. high, branching above, entirely smooth; leaves lanceolate-linear and linear-oblong, 2-3 cm. long, 3-6 mm. wide, sessile, erect, obtuse or obtusish at each end, serrate toward the apex with appressed subulate teeth, the lower surface entirely smooth with the three ribs prominent, the upper surface with scattered, subulate hairs and the ribs impressed; flowers 1-3 at the summits of the stem and branches, borne on short peduncles; calyx urceolate, its mouth and linear lobes armed with stiff, yellow, subulate hairs; corolla 4 cm. broad when expanded; petals magenta-red, un-



RHEXIA ARISTOSA, Britt.

equally obovate, rounded but obtusely pointed and tipped with an arista 2mm. in length and clothed with a few scattered hairs; filaments 7 mm. long, equalling the anthers. Fruit not seen.

For this interesting addition to the North American Flora we are indebted to Messrs. E. H. Kilmer and John C. Gifford of May's Landing, Atlantic County, New Jersey, who collected it in August, 1888, at Egg Harbor City. The specimens were communicated to me by Rev. Dr. John C. Peters, an alumnus of Princeton College, who has furnished much valuable information concerning the plants of that portion of the State. It had previously been collected by Capt. John Donnell Smith in Sumter County, South Carolina, and I am indebted to Dr. Watson for a sprig from the specimen preserved in the Gray herbarium. The Egg Harbor plants evidently grew in water, which had, however, dried up at the time of collection. N. L. BRITTON.

New Varieties of Well-Known Species.

ARABIS LÆVIGATA, (Muhl.), Poir., var. BURKII.

Leaves linear or lance-linear, entire or rarely with one or two teeth, not auricled at base; flowers half the usual size; sepals broad, and as long as the petals; seeds wing-margined.

Found first (1852) on the dry hills of Franklin Co., Penn., where it is common, and later (1867) near Harrisburg, by Mr. Isaac Burk.

FRAGARIA VESCA, L., var. AMERICANA, (var. *β.*, Torrey & Gray, Fl. N. Am. 1, p. 148).

Softly villous; leaves thin, becoming glabrate with age, sharply serrate-dentate; scape and peduncles slender; flowers small; fruit ovoid, of a light pink color; surface of the receptacle smooth and shining, not pitted; akenes prominent and barely attached to it.

The European plant is naturalized in many places, but this variety is undoubtedly native. It occurs on cliffs, in wild, shaded ravines, and has been collected at a number of stations in the northern United States and Canada.

RUBUS VILLOSUS, Ait., var. MONTANUS.

More slender and smaller in all its parts; fruit oblong, or

conical, like a narrow thimble, sometimes an inch in length, less soft and fleshy and possessed of a peculiar flavor.

Abundant on the higher mountains of New York, New Jersey and Pennsylvania, it goes everywhere by the name of "the mountain blackberry."

ASTER PRENANTHOIDES, (Muhl.), var. LONGIFOLIUS.

Leaves thin, deep green, sharply serrate above the middle, the larger ones 5 to 8 inches in length, narrowly lanceolate, tapering into a long acumination, the contraction below the middle nearly obsolete.

This well-marked variety has been found in Northampton, Delaware and Luzerne Counties, Pennsylvania.

THOS. C. PORTER.

Botanical Notes.

The Missouri Botanic Garden. The provisions of the will of Mr. Henry Shaw, the philanthropic millionaire of St. Louis, have recently been made public, and botanists have every reason to be highly gratified with them. For the whole of his vast estate, representing a present valuation of more than $3,000,000, is left in trust for the support of the gardens which were his delight during the latter portion of his long life-time, and which will thus be supplied with an income second only to that of Kew. This must give a most powerful impetus to the study of botany and horticulture. The great income, it is stated, will probably be materially increased in the appreciation in value of real estate now lying on the outskirts of the city.

Dr. Wm. Trelease, the professor of Botany in Washington University, has been fittingly chosen as Director of this important establishment. His time must necessarily be largely occupied with administrative details, but we hope that these will not altogether interfere with further contributions from his pen towards the elucidation of critical problems in North American Botany.

Reviews of Foreign Literature.

Freie Gefässbündel in den Halmen von Olyra. In a late number of "Flora" is an article by Fritz Müller from Brazil. The author describes the joints of a certain species of *Olyra*, a

grass which grows there in dense masses on the boundaries of their forests, as containing free vascular bundles stretched from one end of the joint to the other. The word free is not used here in the ordinary sense of a bundle ending free, but rather the opposite. This bundle is described as a string or thread extending through the joint and, in its perfect condition, adhering at both ends. Sometimes this string is tense, sometimes with coils and spiral windings, forming a snarl of the different threads which nearly fills the cavity. These grasses are said to reach the height of two feet and over, and the length of the joints to vary greatly. The seven lowest joints of one stem are recorded as varying from eighteen centimeters to five-tenths of a centimeter in length. They also vary in regard to the presence of the vascular bundle. No rule could be found regulating the appearance of these strings. They never occurred nearer the growing end of the stem than the fourth or fifth joint, those above these being solid; anywhere else along the stem they were liable to occur.

The upper ones are described as transparent enough to allow their structure to be determined without cutting. The bundle consists of a central annular duct enclosed by two kinds of cells, which are described as long with narrow diameter, the outer ones being thin walled and whose long diameter is about twice that of the other two dimensions.

The author is unable to give any reason for the existence of these threads, neither does he give the manner of their origin, farther than to suggest that their growth does not take place exclusively at the lower end. In conclusion he states that he has sought in vain in the joints of many other grasses for this appearance; also in two other species of this same genus with no result.

E. L. G.

Sur la présence en Anjou de l'Equisetum littorale, Kühlwein, par M. L'abbé Hy. (Bull. Soc. Bot. France, xxxvi, pp. 312-314). Although reputed to be a rare species, *Equisetum littorale*, on account of its habitual sterility, has probably been much overlooked. To distinguish it from *E. arvense* and *E. limosum* with which it ordinarily grows, the following characteristics are given: The central medullary canal is reduced to one-half the

diameter of the stem, whereas, in *E limosum* the stems are largely fistulose. From *E. arvense* it may be distinguished by the first internode of the branches surpassing little if any the length of the corresponding foliage. The anatomical characters still further separate them. In *E. littorale* each fibro-vascular bundle or ridge of the stem is encased in a special endodermis, in *E. arvense* a common endodermis surrounds the exterior of the central cylinder.

If *E. littorale* is really as rare as reported its geographical distribution can only be accounted for on the ground of hybridization. Without having direct proof the author is inclined to consider it a hybrid between *E. arvense* and *E. limosum;* its characters are absolutely intermediate. He agrees with Milde and not with Duval-Jouve in his conclusions.

E. G. B.

Diatomées Fossiles du Japon. J. Brun and J. Tempére. (Reprinted from Memoires de la Société de Physique et d'Histoire Naturelle de Geneve. Tome xxx. No. 9.)

The volume is devoted to the calcareous earths of Sendai and Yedo, and consists of seventy-five pages of text accompanied by nine beautifully executed phototype plates embracing 135 figures. Prof. Brun, of the University of Geneva, has so long been known as a standard authority upon the Diatomaceæ, that this work will be welcomed as a valuable contribution to the literature of the subject. It is worthy of note that some of the species figured occur also in the famous Santa Monica earth. Others are found in the Atlantic City fossil deposit recently described in this journal.

C. H. K.

Index to Recent American Botanical Literature.

Adonis. H. H. Rusby. (Drug. Bull. Nov. 1889, reprinted). Illustrations are given of *A. vernalis*, *A. autumnalis* and *A. æstivalis.*

Algarum ex insula Georgia Australi—Species et genera nova. P. F. Reinsch (Ber. Deutsch. Bot. Gesellsch. vi. 144-156).

New species are described in the genera *Desmarestia*, *Polysiphonia*, *Kalymenia*, *Gracillaria*, *Rhodomenia*, *Delessaria*, *Nito-*

phyllum, Bonnemaisonia, Choreocolax, Ptilota and *Callithamnion.* The following are new genera, each with a single new species: *Chroa, Merenia, Straggaria.* Collected during the German Transit of Venus Expedition, 1882–'83.

Algen—Brazilien Gesammelten, Bearbeitung der von H. Schenck. M. Mobius. (Hedwigia, xxviii. 309-347; t. X. and XI). 64 species (including one *Chara*) are enumerated and novelties described in the following genera: *Spirocoleus; Entophysa,*—a new genus, found in the tissues of *Chara Hornemanni; Acetabularia; Dictyopteris; Gracillaria.*

Bahamas.—The Botany of the. Chas. S. Dolley. (Proc. Acad. Nat. Sci. Phila., 130-134, 1889).

On the occasion of presenting for publication a paper entitled "A Provisional List of the Plants of the Bahama Islands," by John Gardiner and L. J. K. Brace, which we shall hope to notice in these columns as soon as it is issued, Professor Dolley remarked on the general character of the Bahaman Flora and its relation to that of Florida and Bermuda. In this connection we would state that Dr. and Mrs. Northrop are now in Bahama, prepared and equipped to obtain extensive collections of both animals and plants. The club may therefore anticipate hearing some account of this exceedingly interesting flora at no very distant day.

Bald Cypress—The. W. P. Wilson. (Forest Leaves, ii. 110, 111, illustrated). This little article includes a discussion upon the nature and functions of "knees," and the figure of the tree, (*Taxodium distichum*) is an exceedingly good one, reproduced from one of Dr. Rothrock's photographs. The theory that the knees are respiratory organs is maintained.

Cochliostema Jacobianum. (Garden, xxxvi. 477, illustrated).

Color Character—The. Edward L. Greene (Pittonia, ii. 35-46; advance sheets).

Professor Greene shows how stable a character color is in certain great groups of plants, and does not approve of naming albino forms.

Contributions Towards a List of the Fauna and Flora of Wet Mountain Valley, Colorado.—II. T. D. A. Cockerell. West Am. Sci. vi. 134-136).

The monocotyledonous plants of the region are here enumerated.

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Croton Alabamensis. C. Mohr. (Garden and Forest, ii. 592, fig. 150).

Desmidieer frau Grönland. Robert Boldt. (Bihang till Kongl-Svenska Vet. Akad. Hand. xiii. Afd. III. No. 5, pp. 48; two plates).

This is a list of Greenland Desmidiaceæ, with localities and descriptions of new species in *Euastrum*, *Cosmarium*, *Xanthidium*, and *Staurastrum*. The plates represent fifty-three of the species and forms enumerated. The paper was noted some months since in the "Botanisches Centralblatt," but this number of the "Bihang" has only recently come to us. It contains also a lengthy tabulation by the same author of the geographical distribution of all known arctic Desmids.

Exotic Fungi—Some. M. C. Cooke. (Grevillea, xviii. 34, 35).

Cintracta Patagonica, from Patagonia; *Dendrodochium verticillatum*, from South Carolina, *Hydnum cretaceum*, *Gnomonia coriacea* and *Micropeltis maculata* are described by Dr. Cooke and Mr. Massee.

Eleocharis—The Genus in North America. N. L. Britton. (Journ. N. Y. Mic. Soc. v. 95-111, reprinted)

Dr. Britton has here given us a critical account of the relationships and synonymy of this somewhat difficult genus, with a careful account of the geographical distribution, and a valuable numerical reference to the chief collections of each species and variety. He finds that 40 species are North American, with 36 occurring in the United States, just "double the number known to Dr. Torrey in 1836." The author's conclusions regarding the value of certain characters in classification are important, and are stated in the following sentence: "I am not unaware that histological details have been invoked in the classification of this natural order, and I have been particularly impressed by the extremely minute and laborious researches of Palla as published in Engler's Bot. Jahrb. x. 293, but as the results reached by him appear to me to destroy natural alliances rather than to ascertain them, I have not used the arrangement of the fibro-vascular bundles of the stem as proposed by him, nor, indeed, have I found it necessary to invoke it."

The paper is the result of studies extending over several years,

during which a great number of specimens, both at home and abroad, have been studied. *E. Parishii* is a new species from Agua Caliente, San Diego Co., Cal., No. 1569, Coll. of S. B. Parish.

H. H. R.

Fern Flora of Canada. George Lawson. (Halifax, N. S., 30 pp. small 8vo. illustrated.)

This neat little book is intended for the use of schools, comprising a description of all ferns known to inhabit the Dominion, with localities where they grow. An introductory portion of ten pages is accompanied by illustrations of seventeen genera and will be very helpful to the beginner. Professor Lawson adopts in all cases the oldest specific name, and uses other names than those generally accepted for several genera, notably, *Dennstædtia* for *Dicksonia punctilobula.* On the whole this is an interesting little book and commends itself to those who are interested in the geographical distribution of ferns, and indeed to all lovers of these plants. E. G. B.

Ghiesbreght, Augustus B. Explorador de Mexico; *Veda y trabajos del Naturalista Belga.* Jose N. Roriosa. (La Naturaleza, i, (2d ser. pp. 211-217).

From this grateful tribute to the fifty years of labor of one who has done so much both botanically and zoologically for Mexico, we learn that Auguste Boniface Ghiesbreght was born in Brussels, March 10, 1810. He studied and practiced medicine in Belgium till 1836, when Leopold I. commissioned him and Linden and Funk to investigate the natural history of Mexico. These three accompanied Henri Galeotti in his ascension of the peak of Orizaba in 1838, and made extensive collections at elevations ranging from 9,000 to 12,000 feet. In 1839 they collected extensively at Tabasco and Chiapas, returning to Belgium once a year for three years with extensive collections. Later Ghiesbreght alone visited the "Northern and Southern States, crossed the Cordilleras three times from ocean to ocean, traversed the great Mesa, and ascended the volcanoes of Colima, Jorullo and Cempoaltepec."

He lived at Teapa from 1855 to 1862, making extensive explorations and collections of living and pressed plants which

he took to Belgium. In 1862 he settled at the capital of Chiapas, San Cristobal Las Casas, and made extensive collections of insects, molluscs, orchids, agaves and bromeliads. Many of the latter were transported living to Europe and were described by Lindley in the "Flore des Serres et des Jardins de l'Europe." His collections are scattered through the museums and academies of Belgium, England, France, Switzerland, Germany and Russia.

E. G. B.

Grasses of Mountain Meadows and Deer Parks. F. L. Scribner. (Bull. Agric. Exp. Station, Univ. of Tenn. ii. 59–67, illustrated.

In addition to the material previously given by the author under the title of "The Grasses of Roan Mountain," tables of analyses are here given of several of the grasses mentioned, and a figure of *Danthonia compressa.*

Herbarium and Plant Descriptions Adapted to any Botany. E. T. Nelson (4to., Boston, Allyn & Bacon, 1889, 75 cents).

This is another aid for the ready determination of plants from descriptions, designed to effect at the same time a preservation of the specimen examined. Each plant is assigned four pages. The first contains printed headings to be filled in by the pupil, and the specimen is to be mounted on the third, the folded sheet then serving for a species cover. These sheets are put up in portfolios of fifty.

Hypertrophied Hairs on Ampelopsis. John A. Ryder. (Proc. Acad. Nat. Sci. Phil, Part II 155, 1889).

Prof. Ryder called attention to certain enlarged hairs on the leaves, petioles and tendrils of the Japanese species.

Leguminosæ novæ vel minus cognitæ Austro-Americanæ. I. P. Taubert. (Flora, lxxii. 421–430).

Sellocharis is a new genus related to *Lotus*, and *S. paradoxa* a single species. *Crotalaria Urbaniana, Sesbania oligosperma, Æschynomene Riedliana, Chætocalyx Ilheotica, C. Glaziovii, Cranocarpus Mezii, Galactia Aschersoniana, Camptosema pentaphyllum, Rhynchosia Schenckii* are newly described. All are from Brazil.

Neilliæ.—The North American, Edward L. Greene. (Pittonia, ii. 25–31.

Professor Greene reviews the history of these shrubs, discusses their relationship to the Asiatic species, from which he concludes they are not to be generically separated, shows that the genus *Physocarpa* is referable to Rafinesque before Maximowicz and gives us valuable notes on the species, which stand as follows: (1) *N. opulifolia* (L.), S. Wats.; (2) *N. capitata* (Pursh), Greene, which is *N. opulifolia* var. *mollis* of the California botany; (3) *N. monogyna* (Torr.), Greene., the *N. Torreyi*, S. Wats., and whose early name we are glad to see restored, and (4) *N. malvacea*, n.sp. from northern Idaho, a remarkable species, differing from the others mentioned from its non-inflated carpels. Besides these, Prof. Greene suspects a fifth species in the plant of the southern Alleghenies, which has not been much collected.

N. L. B.

New York—Annual Report of the State Botanist, made to the Regents of the University, February 25th, 1889. Chas. H. Peck. (From 42d Rep. Mus. Nat. Hist.; pamph. pp. 48; two plates, Albany, 1889).

Mr. Peck reports on the work done in the botanical department of the State Museum of Natural History during the year previous to this date. 268 species were added to the herbarium, of which 108 were new to it, among them *Hieracium præaltum* from Lewis Co.; *Pentstemon lævigatus* from near Rome; *Physalis Peruviana* from Manor, L. I.; *Quercus heterophylla* and *Q. Rudkini* from Staten Island; *Sparganium affine* (so called) from the Adirondack Mts. *Setaria verticillata* and *Apera Spica-venti* from Lansingburgh, and *Equisetum littorale* from Oneida Lake, and the rest fungi, of which the usual large proportion (46 species this time) are described as new. Under "Remarks and Observations" we note *Proserpinaca pectinacea* reported from Manor, L. I., a remarkable form of *Solidago nemoralis* with white rays from Elizabethtown, Essex Co.; *Coreopsis trichosperma*, var. *tenuiloba* from Eastport and Patchogue, L. I.; *Arceuthobium pusillum* from several localities in Chenango County, found by Mr. Coville; a new locality for *Epipactis* in Onondaga Co., an additional note on *Trillium grandiflorum*, var. *variegatum*, and other interesting items. Mr. Peck gives also a review of the New York species of *Clitopilus*, a genus of pileate,

fleshy fungi, enumerating fourteen species, of which eleven are of his own description. As no references to literature are given, we cannot tell from this document how many of them are described here for the first time. N. L. B.

Pecan Tree—The. Chas. Mohr. (Garden and Forest, ii. 569, 570).

In this article, which is mostly concerned with the economic value of the tree, we are pleased to note that the author has adopted the name *Hickoria Pecan.*

Pelargonium—The Horseshoe. F. L. Sargent. (Pop. Sci. News, xxiii. 181, 182, illustrated).

Piuus Banksiana on the Maine Coast. Edward L. Rand. (Garden and Forest, ii. 579).

A memorandum upon the article published in the BULLETIN of November, 1889, with some additional notes.

River Birch—The. (Garden and Forest, ii. 591, fig. 149).

This plate represents a characteristic group of trees of *Betula nigra* in winter, when destitute of foliage.

Species—New or Noteworthy. Edward L. Greene. (Pittonia, ii. 17-24; advance sheets).

The following are described as new: *Aster brickellioides*, var. *glabratus; Aplopappus Bloomeri*, var. *Sonnei; A. cruentus; Grindelia Hendersoni; Petasites nivalis; Senecio Franciscanus; S. ionophyllus; S. Gibbonsii; Layia hispida; Eriophyllum tanacetifolium; Prenanthes stricta; Mimulus Scouleri*, var. *cæspitosus; Eunanus angustifolius; Collinsia stricta* and *Monardella discolor.* Many of these were collected by Professor Greene during his exceedingly successful journey of last summer. There are also critical notes on *Scorzonella borealis, Malacothrix altissima, Mimulus Scouleri, Eriodictyon Parryi, Thalictrum hesperium* (*S. platycarpum*, Greene) and *Astragalus anemophilus*, with which is joined *A. Miguelensis.*

N. L. B.

Thismia Glaziovii—Une nouvelle Phanérogame sans Chlorophyll. V. A. Poulsen. (Revue Bot. i. 549, 550).

A preliminary note on a new saprophytic species of Burmanniaceæ, little more than two inches in height, from humus in a

Brazilian forest. An anatomical study of this interesting plant will soon be published.

Trinidad.—Annual Report on the Royal Botanic Gardens for 1888. J. H. Hart. (Pamph. 4to. pp. 41, Gov. Printing Office, Port of Spain, 1889).

Unifolia.—Geographical Distribution of Western. Edward L. Greene. (Pittonia, ii. 31-35; advance sheets).

Evidence is adduced to show that *U. sessifolium* has not been found east of the Coast Range, and that *U. stellatum* actually crosses the continent as does *U. racemosum.* More fruiting specimens are called for.

Yucca elata. (Garden and Forest, ii. 568, fig. 146).

Proceedings of the Club.

The regular meeting of the Club was held at Columbia College, Dec. 10th, the Vice-President in the chair and twenty-two persons present.

An Amendment to the Constitution was adopted, making the regular meetings of the Club twice a month. The announced lecture of the evening "Fungus Diseases of the Cranberry," by Professor Byron D. Halsted was then delivered. The substance of his remarks was as follows:

The minute, red galls upon the cranberry leaves, stems, flowers and fruit, are caused by a unicellular fungus known as *Synchytrium Vaccinii*, Th. It is probably at present confined to the Marian Bog, near Brown's Mill, Burlington County, New Jersey. The following additional members of the Ericaceæ are hosts to this gall fungus: *Rhododendron viscosum, Kalmia angustifolia, Clethru alnifolia, Cassandra calyculata, Gaylussacia resinosa* and *Gaultheria procumbens,* in all of which the fungus-bearing cell of each gall is much alike, but in the galls themselves there is a wide variation upon the different hosts. These plants are infested only when within reach of the bog water and above the high tide or flood mark no galls are to be found. In a portion of the bog, cut off by a railroad grade with no waterway through it, there were no galls. The upper portion of the bog is upon two streams which join near its middle.

Up one of these streams no galls could be found, while along the other there was an abundance. It seems clear that the first point attacked was upon the latter stream, and the disease has spread with the water. It was found upon vines for miles below the bog in question, and doubtless would ruin other bogs below this one if there had been any to infest. The gall fungus is fond of much moisture and probably would be checked by leaving the bog dry through the winter and preventing, if possible, floods in spring. The bog is now almost worthless and picking was confined to those areas not bathed by the contaminated water. The cheapest, quickest and most thorough treatment would be to burn the diseased vines and start again. As several related plants along the shore of the bog are also affected, it is evident that these also must be destroyed.

The so-called "cranberry scald" causes the loss of about one-third of the cranberry crop in New Jersey, where it is now mostly confined. The affected berries at first show a soft spot which may spread over the whole fruit and give it a light brown color. Soon after this the berry becomes wrinkled, and small pustules appear, bearing spores. The diseased spot of a berry when first affected is filled with the branching filaments of a fungus. The whole diseased plant abounds in these threads and upon the leaves at least two kinds of spores are formed, one pycnidial and the other ascosporous. The fungus causing the scald has not been fully determined, but it is in many respects closely related to *Physalospora Bidwellii*, which causes a somewhat similar decay of the grape known as the black rot.

The thanks of the Club were extended to Prof. Halsted for his interesting and instructive address.

Dr. Britton exhibited a set of thin cross sections of North American woods, mounted for lantern slides, prepared by Mr. Romyn B. Hough, of Lowville, New York, and remarked on the beauty and value of the preparations.